

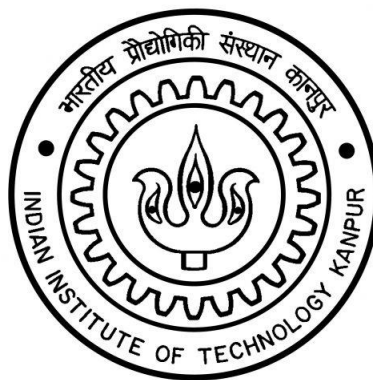
HYDERABAD METRO TRANSIT DATA ANALYSIS



Rohan Sai Adiserla

M. Tech Student

IIT KANPUR



How do we solve this congestion problem?



Source: <https://www.m9.news/politics/caught-on-camera-ameerpet-metro-stations-horror/>

- 1) Optimizing routes
- 2) Understanding travel patterns

PRELIMINARY SEGREGATION

Area-Wise Categorization:

Let's divide the areas covered by the metro into specific categories. For example, the Miyapur-Balanagar metro route is predominantly in a residential area, while the Raidurg to Madhapur route is primarily in a corporate area. This categorization will help us anticipate travel trends on weekdays, holidays, weekends, etc.

Event-Wise Categorization:

This classification can help us manage passenger flow based on event days. For instance, Peddamagudi station might experience more traffic on a Sunday, while Miyapur might see increased traffic due to its proximity to Calvary Temple on the same day. On a cricket match day, the stadium station will likely experience more traffic. This information will allow us to allocate staff and manage traffic accordingly.

Peak Hour Segmentation:

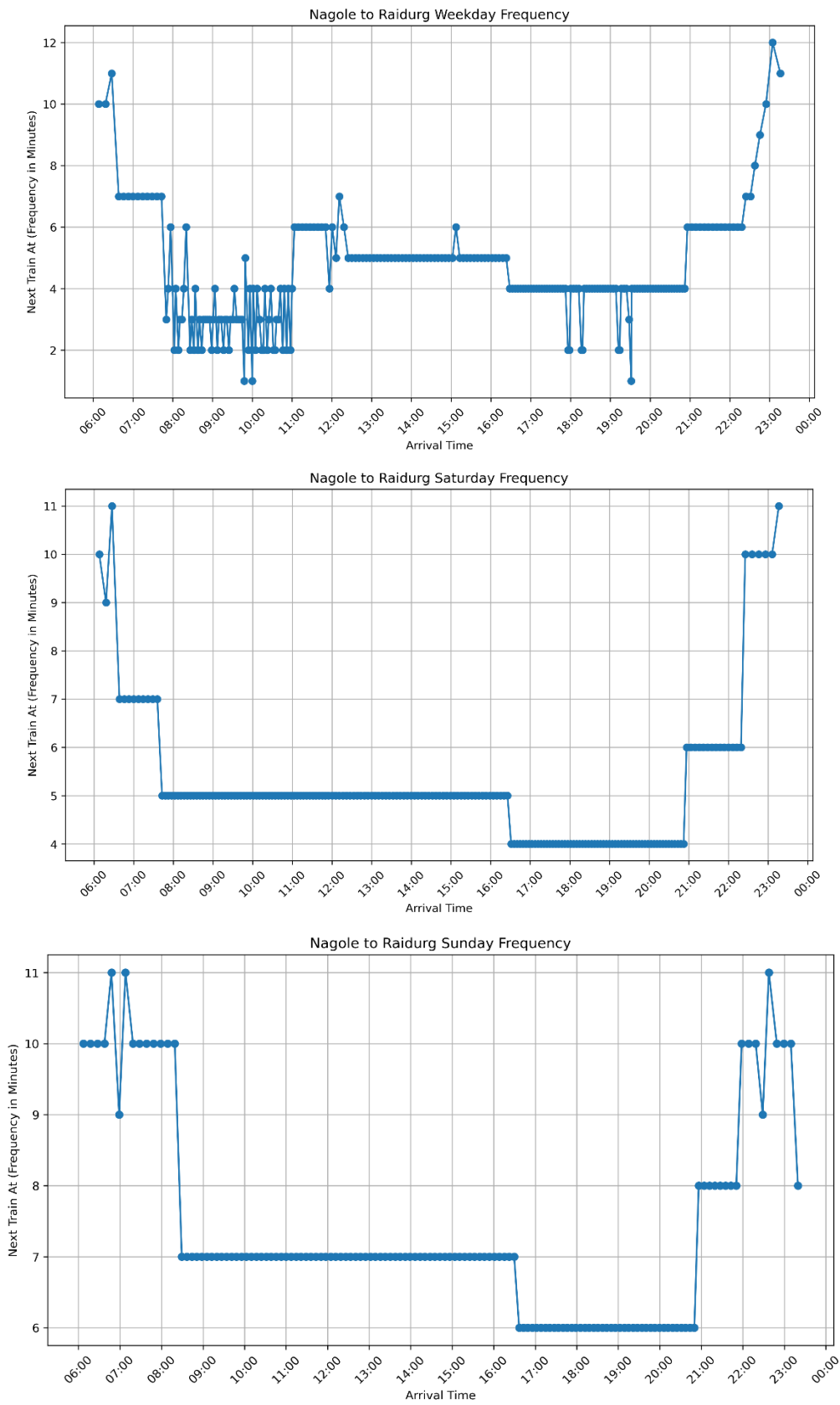
This segmentation is designed to observe patterns throughout the day. By classifying our duty hours into peak and off-peak hours, we can optimize the frequency of trains.

FREQUENCY ANALYSIS:

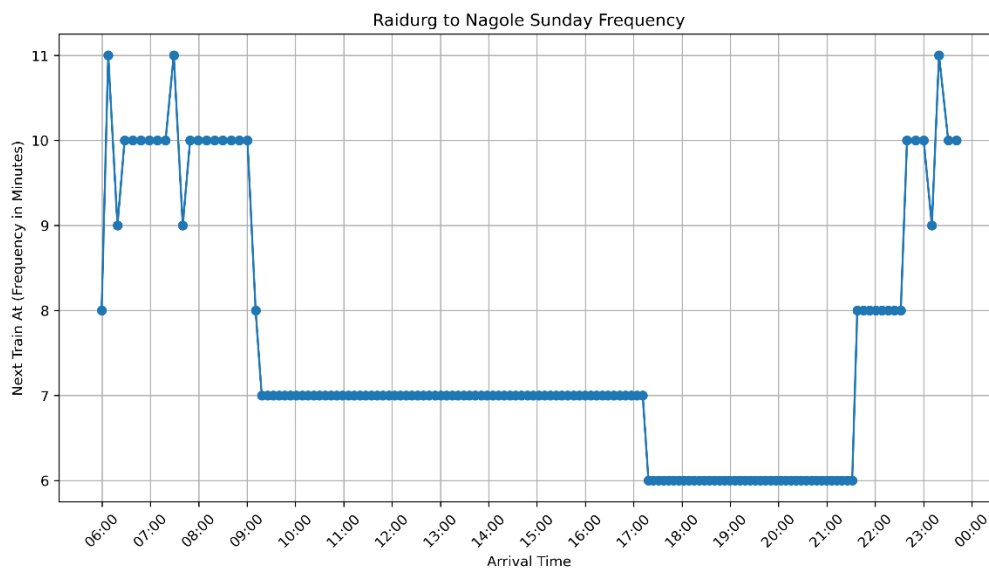
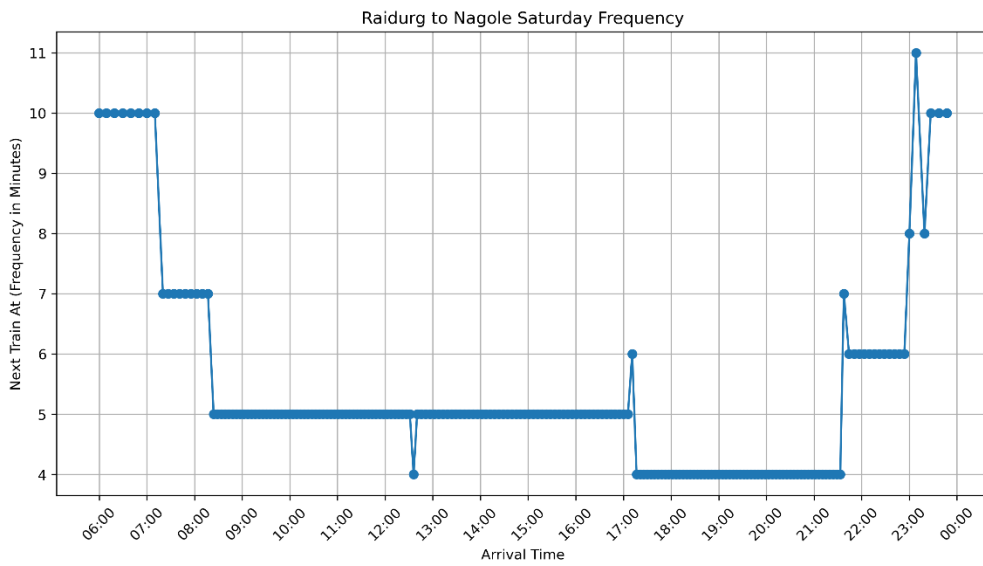
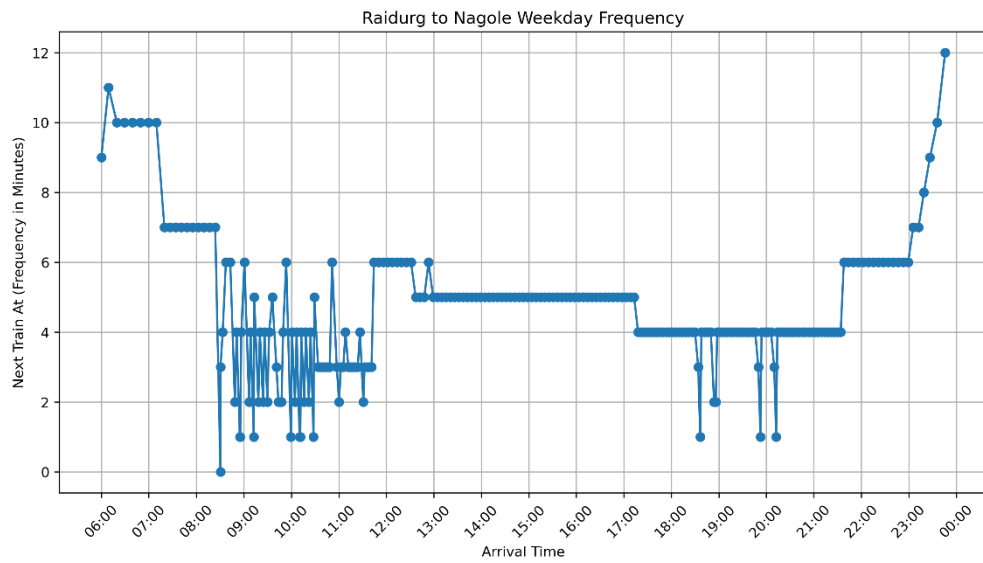
DATA SOURCE: <https://data.telangana.gov.in/>

From the data source, I have analyzed the frequency of trains traveling on each route of the Red and Blue lines. Since all four routes share Ameerpet station as a common point, the data in the graph represents the frequency of trains arriving at platforms AME1, AME2, AME3, and AME4.

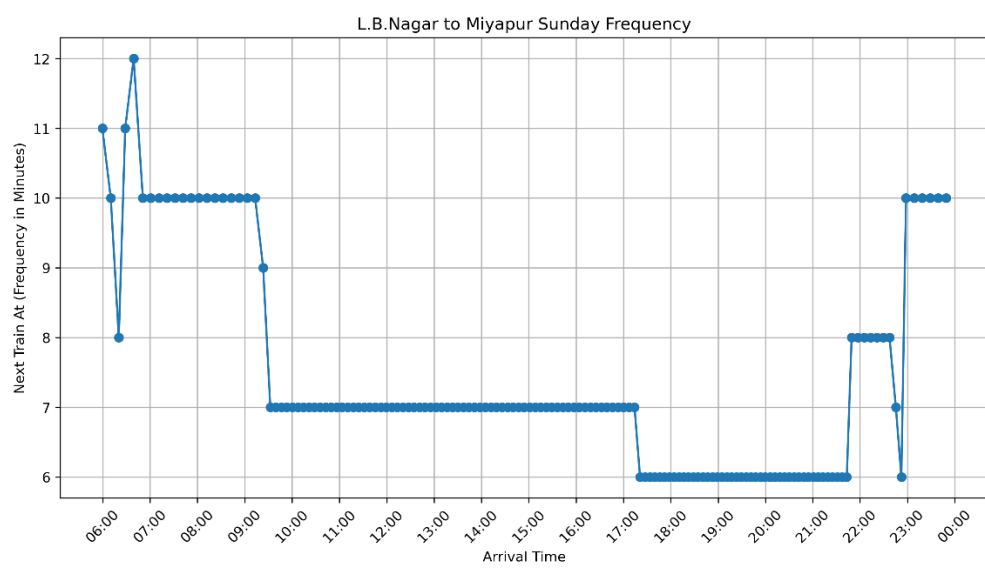
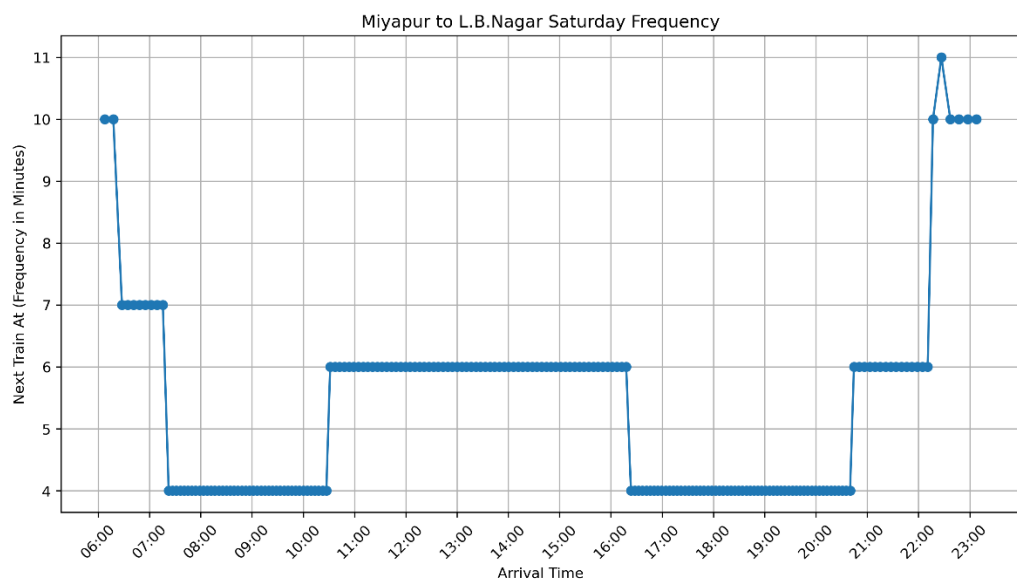
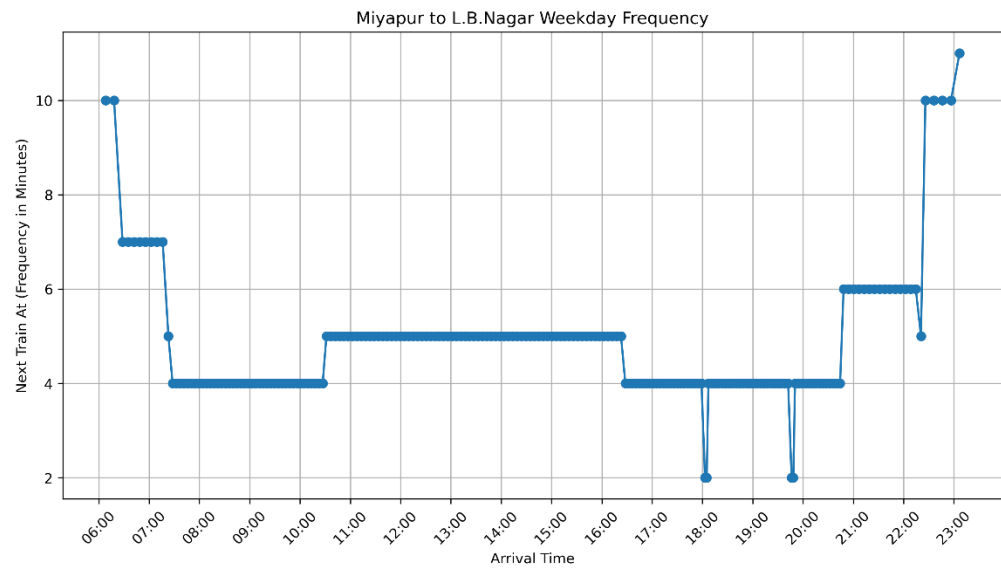
1) BLUE LINE (NAGOLE-RAIDURG)



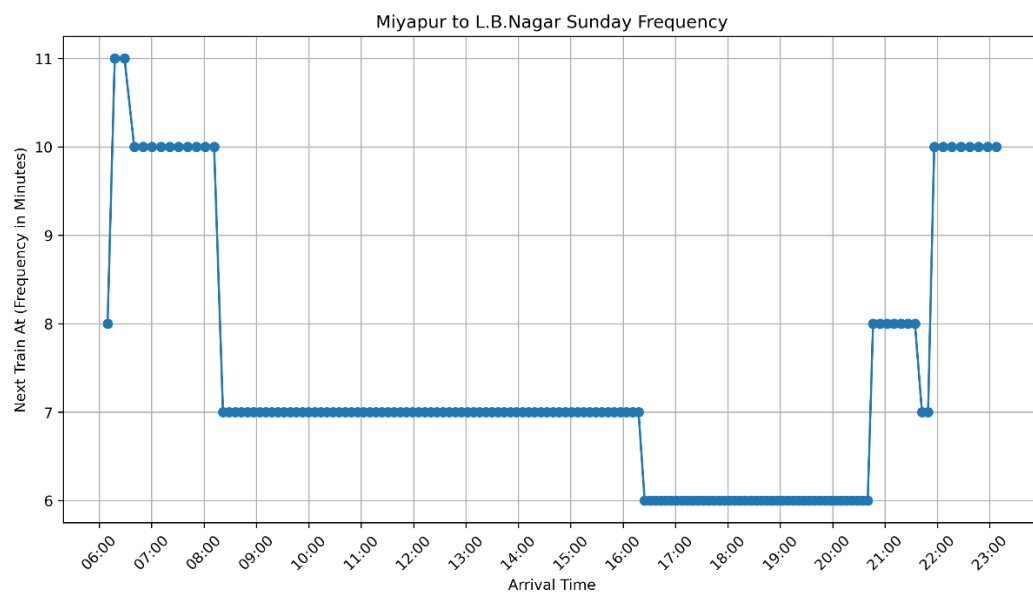
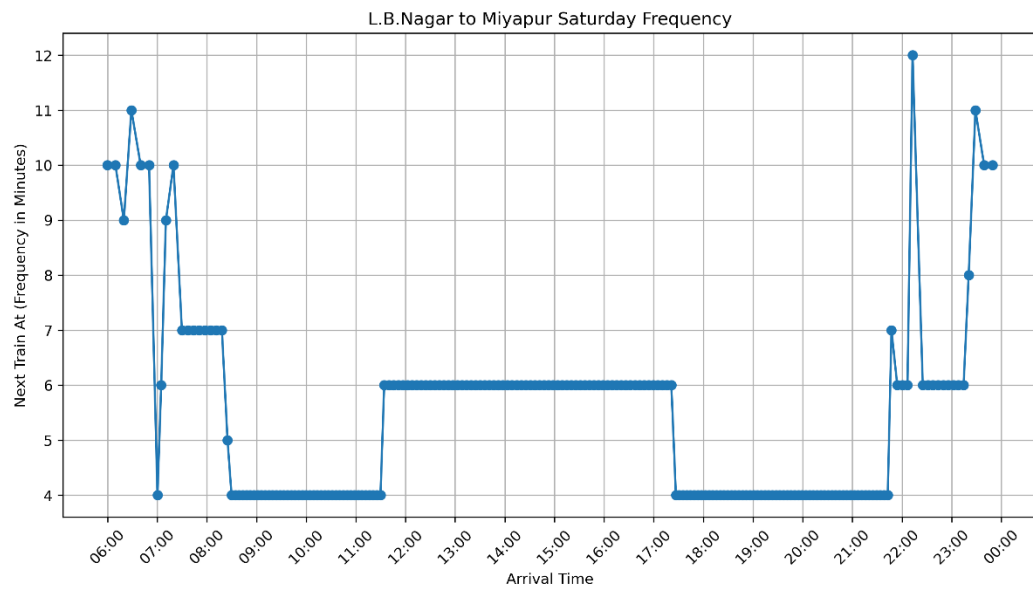
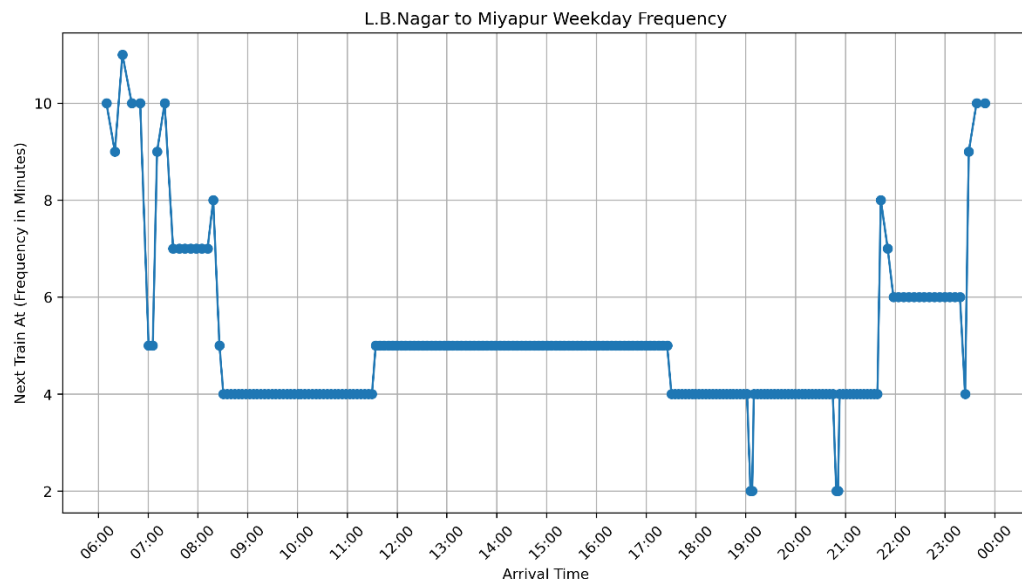
2) BLUE LINE (RAIDURG- NAGOLE)



3) RED LINE (MIYAPUR-L.B.NAGAR)



4) RED LINE (L.B.NAGAR- MIYAPUR)



From the frequency analysis above, it is clear that some consideration is given to peak and non-peak hours. However, the trains generally follow a set template: typically, on weekdays, 8:00-11:00 AM and 5:30-8:00 PM are treated as peak hours, during which the frequency is relatively higher. On weekends, evenings from 5:00-8:00 PM see increased train frequency on almost all routes.

While this template may suffice in certain situations or to some extent daily, it is not enough. The frequency needs to be optimized dynamically. For example, on a rainy day, more people might prefer using the metro, so understanding the travel patterns of our commuters is crucial.

Understanding commuter needs and travel behaviour is essential to improving the overall experience. To gain a better and more detailed understanding of travel patterns, real-time user data may be required, and a dynamic model should be prepared using machine learning predictive algorithms.